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SPECIES OF *TELENOMUS* (HYM., SCELIONIDAE),
PARASITOIDS OF STALKED EGGS OF NEUROPTERA
(CHRYSOPIDAE & BERTHIDAE) (1)

Three species of egg parasitoids of the genus *Telenomus* Haliday (*Hymenoptera: Scelionidae*) have been described that attack the stalked eggs of *Neuroptera* (see, e.g., figs. I-1,2). Two have been given the same name (referring to the host): the Nearctic *T. chrysopae* Ashmead, 1893 and the Palearctic *T. chrysopae* Vassiliev, 1915. The third, the Palearctic *T. acrobates* Giard, 1895 was apparently named for the talents required to parasitize its peculiar host. A summary of the host records of *Telenomus* from neuropteran eggs is presented in Table 1. Recorded parasitism rates range between 11.4% (ALROUCHEDI *et al.* 1981) and 100% (PRINCIPI *et al.* 1978). Parasitism by *Telenomus* obviously can greatly limit the usefulness of chrysopids as biological control agents. For example, PRINCIPI *et al.* (1978) distributed large numbers of *Chrysopa carnea* Steph. eggs in early stages of embryonic development in apple orchards as part of an attempt at integrated control of *Dysaphis plantaginea* (Pass.) (*Homoptera: Aphididae*). This effort was entirely frustrated by the extremely high rate of parasitism. Although there is some variability within the genus, most species of *Telenomus* cannot successfully complete development in host eggs in an advanced stage of embryonic development (see, e.g., FEDDE 1977 and references in JOHNSON 1982, in press). It seems, therefore, that much of the loss to parasitism suffered in this experiment could have been avoided if eggs were not distributed until later in their development.

The taxonomy of the *Telenomus* parasitoids of *Neuroptera* has never been revised from a worldwide perspective. As seen in table 1, *Telenomus* has been reared from chrysopid eggs from the Palearctic, Nearctic, Oriental and Ethiopian regions. Material received for identification indicates that

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Chrysopa spp. from Australia are also parasitized. The Nearctic family *Berothidae* also has stalked eggs, and it too is parasitized by a species of *Telenomus*. Although much less common than chrysopids, it is possible that some of the Nearctic host records of *Chrysopa* sp. may actually refer to berothids. This revision treats species reared from both families of *Neuroptera* because of the remarkable nature of the host eggs. Whenever possible, the morphological descriptions of species are supplemented by characters of the chorion of parasitized host eggs.

ABBREVIATIONS AND TERMINOLOGY

Some new characters and measurements are here briefly defined. For further details refer to BIN (1981) and to the following papers in press: JOHNSON 1982; BIN and DESSART, 1983. T1, T2: metasomal tergite 1, 2; acetabular field: patch of fine coriaceous sculpture near dorsal apex of acetabular carina; claval formula: number of plate sensilla on underside of apical antennomeres, given as segments involved/number of sensilla, e.g., A11-A8/1-2-2-1; episternal foveae: diagonal line of foveae on mesepisternum between acetabular carina and mesopleural pore; intercoxal space: area on ventral portion of mesepisternum between fore and mid coxae; metapleural carina: longitudinal crest between posterior margin of metapleuron and propodeal spiracle, sometimes extending cephalad of spiracle; orbital bands: coriaceous sculpture along inner orbits of eyes; preocellar pit: deep hole located just ventrad of median ocellus, function unknown; total length: measured as sum of: head length in dorsal view, greatest mesosomal length in lateral view, and greatest metasomal length in lateral view.

Telenomus chrysopae Ashmead

(Figs. I, 4-6; II, 1; III, 1; IV, 2; Plates I; II, 1-2; IV)

Telenomus chrysopae Ashmead, 1893: 159, Type locality: District of Columbia, USA.

Host: Egg of *Chrysopa* sp. (*Neuroptera: Chrysopidae*).

Telenomus chrysopae: Kieffer, 1912: 22.

Phanurus chrysopae: Kieffer, 1926: 61-62.

Telenomus chrysopae: Masner and Muesbeck, 1968: 62.

Female. Total length: 1.6-1.8 mm. Color: Head and body dark brown to black; antennae brown throughout; tarsi, bases and apices of femora and tibiae yellow to brownish-yellow; legs otherwise brown to dark brown.

Table 1. — Records of *Telenomus* spp. reared from neuropteran eggs.

Region	Parasitoid	Host	Locality	Reference	
Nearctic	<i>Telenomus</i> sp.	<i>Chrysopa/Hemerobius</i>	Dist. Columbia	Howard 1890	
	<i>T. chrysopae</i> Ashm.	<i>Chrysopa</i> sp.	»	Ashmead 1893	
	»	»	South Carolina	McGregor 1914	
Palearctic	<i>T. chrysopae</i> Vass.	<i>Chrysopa</i> sp.	Uzbek S.S.R.	Vassiliev 1915	
	<i>T. acrobates</i> Giard.	»	France	Giard 1895	
	»	»	»	Feytaud 1913	
	»	»	»	Remaudiere & Le Clant 1971	
	»	»	Romania	Fabritius 1974	
	»	<i>C. septempunctata</i>	Italy	Principi 1940-41	
	»	»	France	Alrouchedi <i>et. al.</i> 1981	
	»	<i>C. perla</i>	Italy	Fuschini 1909	
	»	»	»	Principi 1937	
	»	<i>C. formosa</i>	»	Principi 1947	
	»	<i>C. viridana</i>	»	Principi 1954	
	»	<i>C. carnea</i>	»	Principi <i>et. al.</i> 1978	
	»	»	U.S.S.R.	Niyazov 1969	
	»	»	Uzbek S.S.R.	Radzivilovskaya 1980	
	»	<i>C. vulgaris</i>	Italy	Fuschini 1909	
	»	»	France	Regnier 1923	
	»	<i>C. flavifrons</i>	»	Lacroix 1922	
	»	<i>Telenomus</i> sp.	»	Egypt	Kamal 1951
	»	»	<i>C. carnea</i>	»	Azab <i>et al.</i> 1966
»	»	<i>C. flava</i> & <i>flavifrons</i>	England	Eastop & Fergusson 1977	
Ethiopian	<i>T. acrobates</i> Giard.	<i>Chrysopa</i> sp.	Mauritania	Comellini 1971	
Oriental	<i>Telenomus</i> sp.	<i>C. madestes</i>	India	Mehra 1966	
	»	<i>C. carnea</i>	»	Patel <i>et. al.</i> 1975	

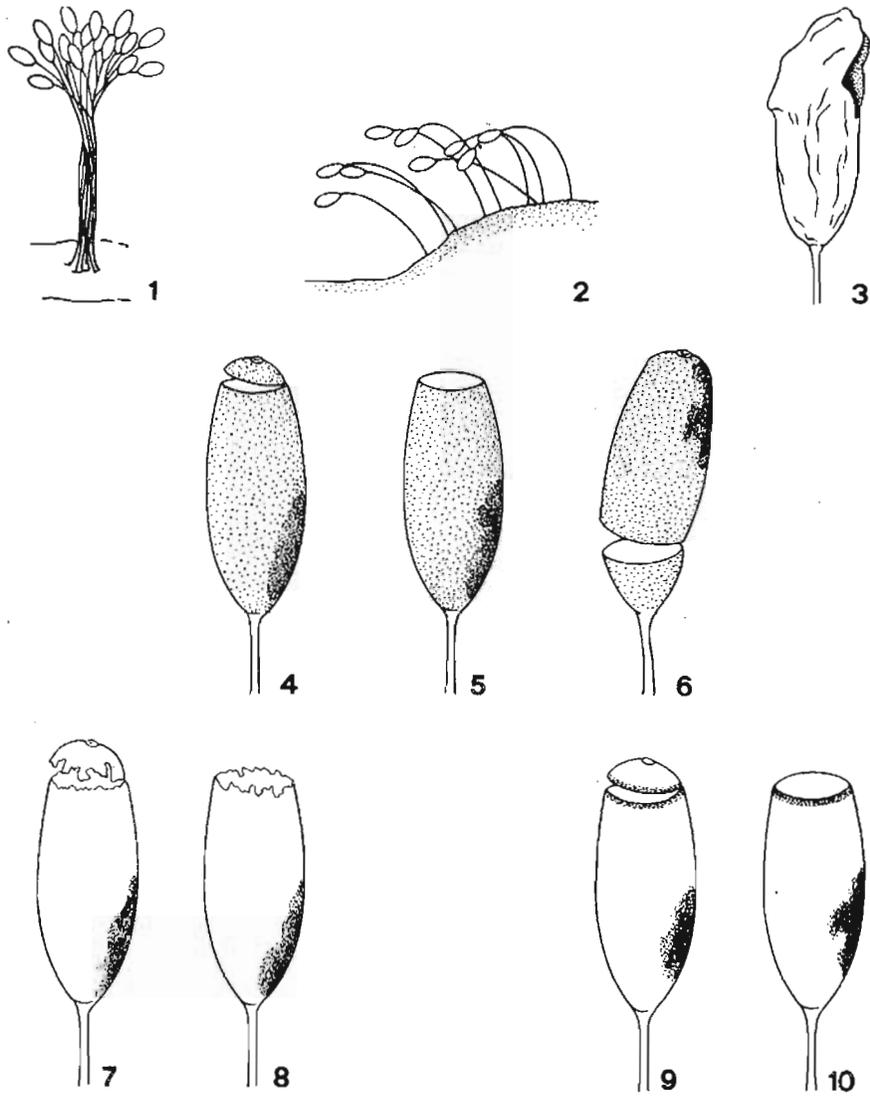


Fig. 1

Egg clusters of 1. *Crysopa flava* Scop. (from HINTON, 1981) and 2. *C. septempunctata* Wesm. with detail of 3. chorion after hatching of the larva (from PRINCIPI, 1940-41). Chorions of *Chrysopa* spp. abandoned by 4-6. *Telenomus chrysopae* Ashm., 7-8. *T. tridentatus* sp. n. and 9-10. *T. ampullaceus* sp. n. Further details in the text.

Head (Pl. I, 1-4): Vertex smoothly rounded onto occiput, scaly-reticulate, setose throughout; no hyperoccipital carina; occiput smooth; occipital carina simple (i.e., not crenulate, usually complete medially, sometimes briefly interrupted; orbital bands present only along lower third of inner orbits; frons width equal to eye height; preocellar pit absent; no ocellar setae; frons between antennal insertions and median ocellus smooth; frontal depression weakly developed; frons not bulging between inner orbits and antennal insertions; frons, lateral of antennal insertions, with several arcuate upturned wrinkles; clypeal margin edentate medially; labral margin produced medially into weak tooth; mandibles distinctly-bidentate; eyes setose; inner orbits rounded at level of lateral ocelli; temples not bulging, narrow, not grooved, bands of coriaceous sculpture along posterior orbits extending, at most, half distance to occipital carina; head, viewed from above, twice as wide as its greatest length; viewed frontally, malar space elongate, height of head only slightly less than width.

Mesosoma (pl. I, 5-6; pl. II, 1): Mesoscutum strongly convex, scaly-reticulate throughout, setal bases weakly pustulate; parascutal furrow not crenulate; notauli absent; scutellum smooth, setose, submarginal foveae smaller than dorsellar punctures; dorsellum only very slightly longer medially than laterally, areolate-rugulosa above, longitudinally striate below; ventral margin of metanotum laterad of dorsellum not crenulate; medial lobes of propodeum acute, without deep apical foveae; acetabular carina simple (not crenulate); width of intercoxal space slightly greater than length of fore coxa; postpectal carina simple; episternal foveae absent; acetabular field large, setose, entering anterior surface of mesopleural furrow, not reaching intercoxal space; mesopleural furrow well-developed; mesopleural carina absent; posterior margin of metapleuron weakly expanded, lamellate, with only a few crenulae; metapleural carina indicated only short posterior spur.

Metasoma (pl. II, 1-2) T1 with 2-3 pairs of lateral setae, 1 pair of sublateral setae, costate only in basal half; greatest length of basal costae on T2 slightly greater than medial length of T2; length of T2 subequal to its greatest width.

Appendages. Antennae (fig. II, 1) 11-segmented; claval formula A11-A8/1-2-2-1; LA2 slightly $>$ LA3; A6 globose or slightly longer than wide; L, W A7 $<$ A8; A8-A10 transverse. Wings clear, surpassing apex of metasoma; basal vein not pigmented; postmarginal vein longer than stigmal; greatest width of hind wing less than 2 times length of fringe at that point.

Male. Genitalia (fig. IV, 2): laminae volsellares in form of single medial rod through most of its length, bifurcating medially to articulate with digiti; digiti small, with 3-4 small teeth/digitus; aedeagal lobe short, truncate;

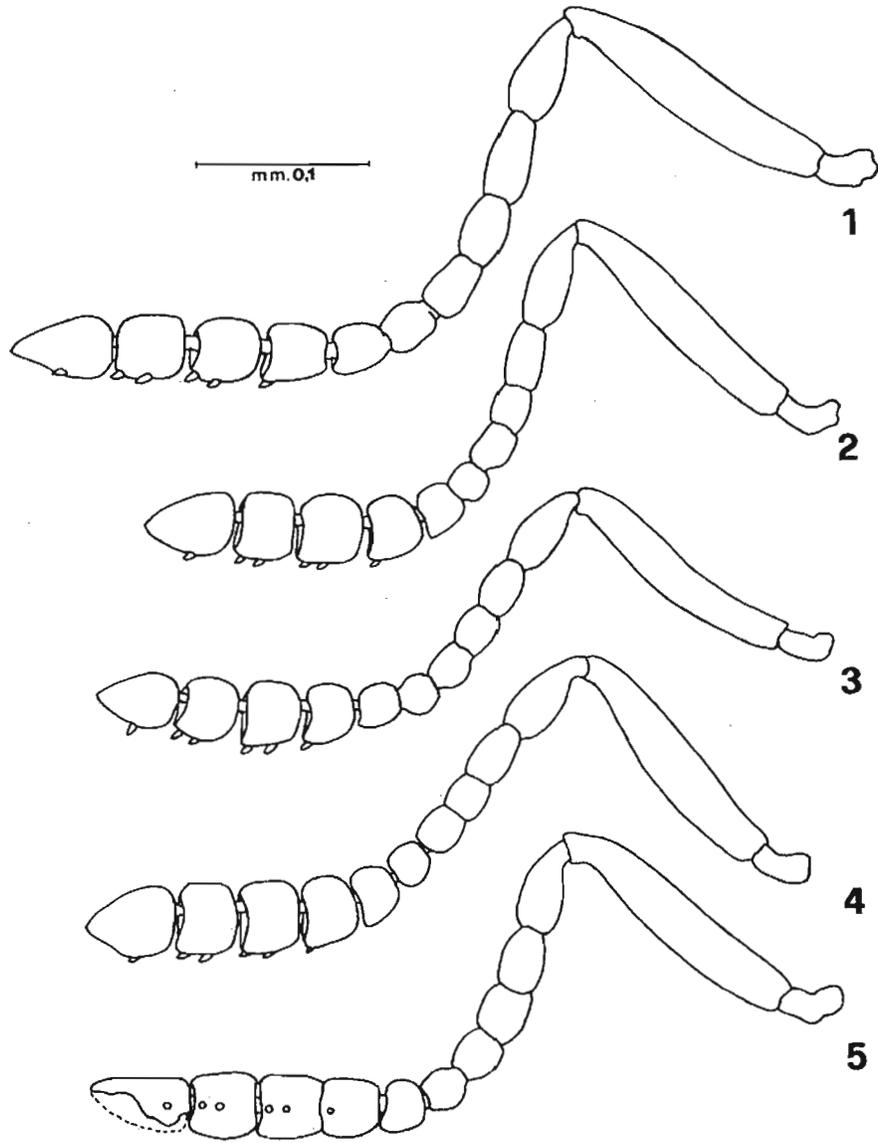


Fig. II

Female antennae of 1. *Telenomus chrysopae* Ashm. - 2. *T. tridentatus* sp. n. -
3. *T. lobatus* sp. n. - 4. *T. suvae* sp. n. - 5. *T. ampullaceus* sp. n.

length of aedeago-volsellar shaft 4.1-4.4 times length of aedeagal lobe, 2.3-2.4 times length of basal ring. Antennae (fig. III, 1) 12-segmented, LA2 < LA3; LA4-A5 > LA3; all antennomeres longer than wide. Otherwise very similar to the female.

Host egg (fig. 1,4-6): chorion, viewed externally, appears dark grey to blue-grey, lighter, almost transparent apically; meconium brown, deposited in bottom of egg, covering surface to which stalk attaches; cap of egg clean, neatly cut off.

Material. Lectotype ♂: District of Columbia, from eggs of *Chrysopa* sp., USNM no. 2225 (USNM). Paratypes: 3 ♂ ♂ with same data as holotype. Other material examined: New York: Tompkins Co., Ithaca, 14-21.IX.1977, N.F. Johnson, ex: *Chrysopa* sp. Quebec: Mt. St. Hilaire, 23.VI-8.VII. 1977, R.L. Manuel, ex egg of *Chrysopa oculata* (Lyman Entomol. Mus.) Japan: Tokyo, 1912, S.I. Kuwana, reared from egg of *Chrysopa* sp. (USNM). Italy: Bari, 27.VII.1966, leg. Monaco, ex egg of Chrysopid on Oleander. Bologna, VI.1940, ex *Chrysopa*, coll. Principi. Netherlands: Wageningen, VII-VIII. 1974, R. v.d. Oever, ex: *Chrysopa phyllochroma*.

Hosts: *Chrysopa phyllochroma*, *C. oculata*, *C. spp.*, possibly *Meleoma emuncta* (Neuroptera: Chrysopidae).

Remarks. *Telenomus chrysopae* is most reliably recognized on the basis of the structure of the male genitalia. The laminae volsellares form a single median rod (paired rods in *tridentatus*, *lobatus*, *suvae*; broad plate in *ampullaceus*); the digital teeth are very small (large in *tridentatus*, *lobatus* and *ampullaceus*); the aedeagal lobe is short - ratio of L aedeago-volsellar shaft/L aedeagal lobe > 3 (< 3 in *tridentatus*, *lobatus* and *ampullaceus*).

The wrinkles on the frons of the female (pl. I, 2), while difficult to see, apparently will distinguish *T. chrysopae* from the other four species described below. All those species have the wrinkles curved in the same direction; *T. chrysopae*, in contrast, has at least a few ventral wrinkles curved in the opposite direction from those dorsal to them.

The characteristics of the host egg will also serve to separate *chrysopae* from *tridentatus* and *ampullaceus* (the host eggs of the other two species were not available to us). The host eggs of *chrysopae* turn dark and have the operculum neatly cut off; both *tridentatus* and *ampullaceus* host eggs remain light in color, *tridentatus* adults cut a ragged hole in the chorion upon emergence.

Telenomus chrysopae is a holarctic parasitoid of chrysopid eggs. It is apparently multivoltine and overwinters as an adult. Its biology has been discussed in detail by PRINCIPI (1940-1941, 1947) under the name *Telenomus acrobates*. PRINCIPI also included illustrations of the adult female, male and

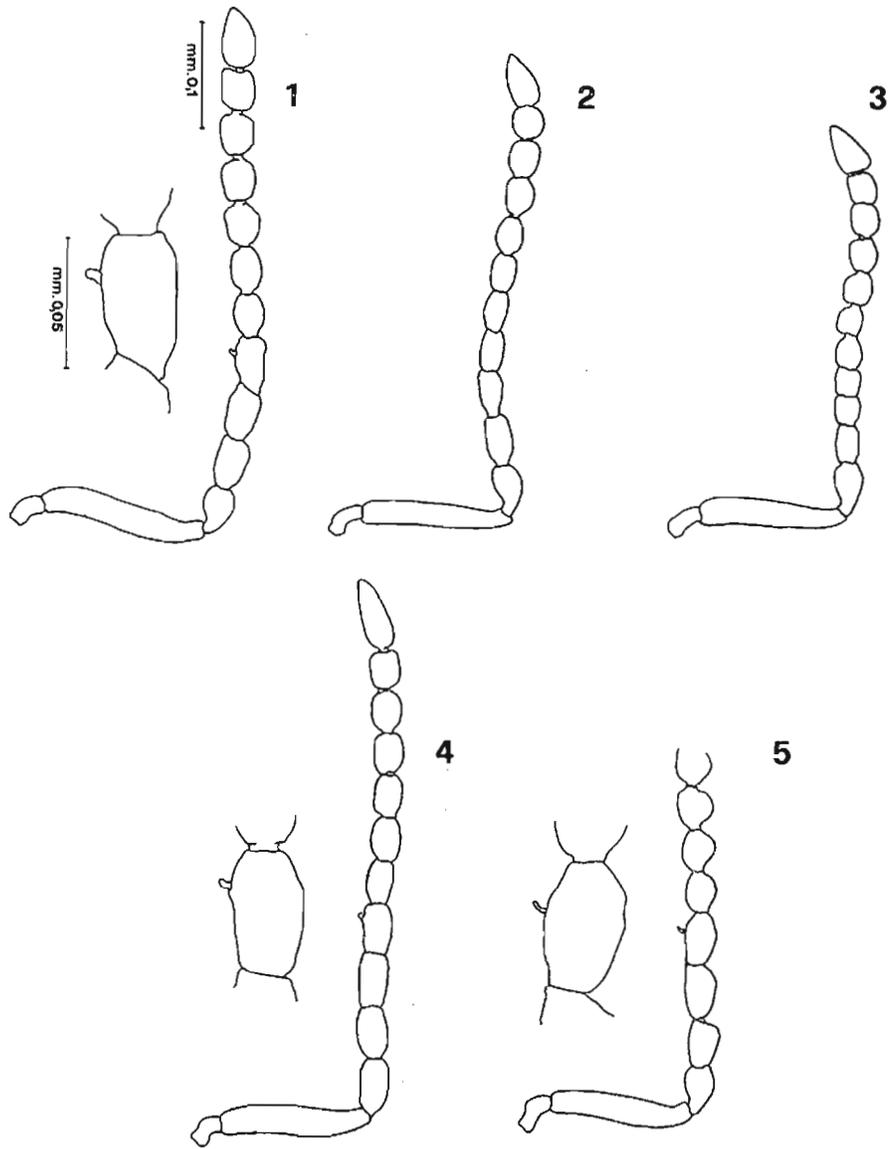


Fig. III

Male antennae of 1. *Telenomus chrysopae* Ashm.. - 2. *T. tridentatus* sp. n., -
3. *T. lobatus* sp. n.. - 4. *T. suvae* sp. n. - 5. *T. ampullaceus* sp. n.

female antennae, wing venation (1940-1941) and the immature stages (1947).

Two species of chrysopid egg parasitoids have been described from Europe: *T. acrobates* from southern France and *T. ferganae* Johnson (a replacement name for *T. chrysopae* Vassiliev) from the UZBEK S.S.R. Drs. S. KELNER-PILLAULT (Museum d'Histoire Naturelle, Paris) and M.A. KOZLOV (Zoological Institute, Academy of Sciences, Leningrad) have informed us that the types of these two species have been lost and, at least for the former, probably destroyed. In the absence of sufficiently detailed description, keys, or illustrations, these two names should therefore be considered as *nomina dubia*. Because of the wide distribution of *T. chrysopae* Ashmead, we believe that Giard's specimens probably belonged to this species. *Telenomus ferganae* may also be a synonym of *chrysopae*, but this is less certain. In any case, because *T. chrysopae* Ashmead is the oldest available name in the genus for chrysopid parasitoids, there should be no nomenclatorial confusion concerning this species.

***Telenomus ampullaceus* new species**

(Figs. I, 9-10; II, 5; III, 5; IV, 3; Plate III, 3, 4, 6)

Agrees with description of *Telenomus chrysopae*, except as follows: mandibles tridentate; wrinkles in malar region curving dorsad (pl. III, 6); male genitalia (fig. IV, 3) remarkable: digiti each with one huge, massive tooth and one smaller one; basal portion of aedeago-volsellar shaft evenly and strongly melanized, no distinct structures visible ventrally; aedeagal lobe rather elongate, truncate apically; length of aedeago-volsellar shaft 2.70 times length of aedeagal lobe, 3.26 times length of basal ring.

Host egg: chorion translucent greenish gray, dark gray along edge where emergence hole is cut; meconium, seen through chorion, with reddish hue, deposited on side, halfway up egg; emergence hole neatly, smoothly cut, no ragged edges (fig. I, 9-10).

Material. Holotype ♂: South Australia: Kangaroo Island, I.1978, ex egg of *Chrysopa* possibly *C. ramburi* Schneider on *Myoporum* sp. (Myoporaceae), C. Boros (ANIC). Paratypes. South Australia: Glen Osmond, III.1978, lab. reared ex *Chrysopa tripunctata* MC1., C. Boros, 1 ♂. Glen Osmond, III 1978, C. Boros, ex egg *Chrysopa* sp., possibly *C. tripunctata* on claret ash, 1 ♀. Glen Osmond, Waite Agricultural Research Institute, IV. 1976, ex egg *Chrysopa* possibly *C. edwardsi* Banks on lemon, C. Boros, 1 ♂, 1 ♀. (Paratypes in ANIC, collection of NFJ).

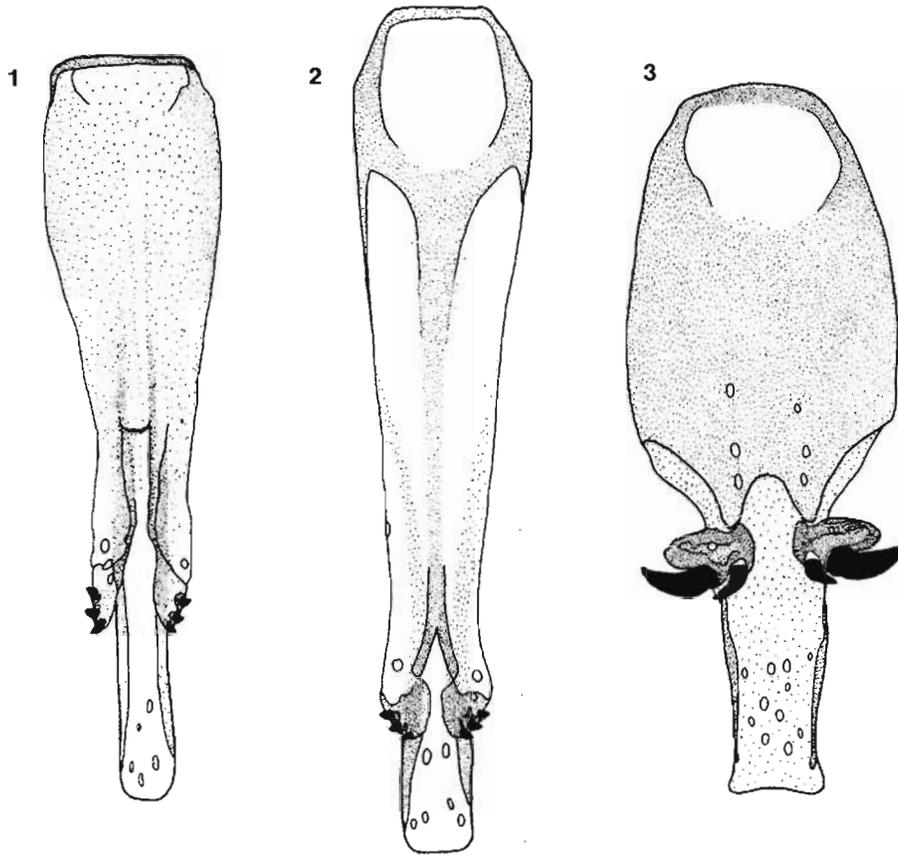


Fig. IV

Male genitalia (ventral view, 667 x) of 1. *Telenomus suvae* sp. n., 2. *T. chrysopae* Ashm. and 3. *T. ampullaceus* sp. n.

Hosts: *Chrysopa* spp., possibly *C. tripunctata* and *C. edwardsi*; reared in laboratory from the former.

Remarks.

Telenomus ampullaceus can only be recognized by the structure of the male genitalia. The large, heavy digital teeth and platelike laminae volsellares will immediately distinguish it from *tridentatus* and *lobatus* (laminae volsellares rodlike), and from *chrysopae* and *suvae* (laminae volsellares rodlike, digital teeth small). We were, however, unable to find any characters diagnostic for the females. Because of this, it may eventually be found that this species has already been described under a different name by A.P.

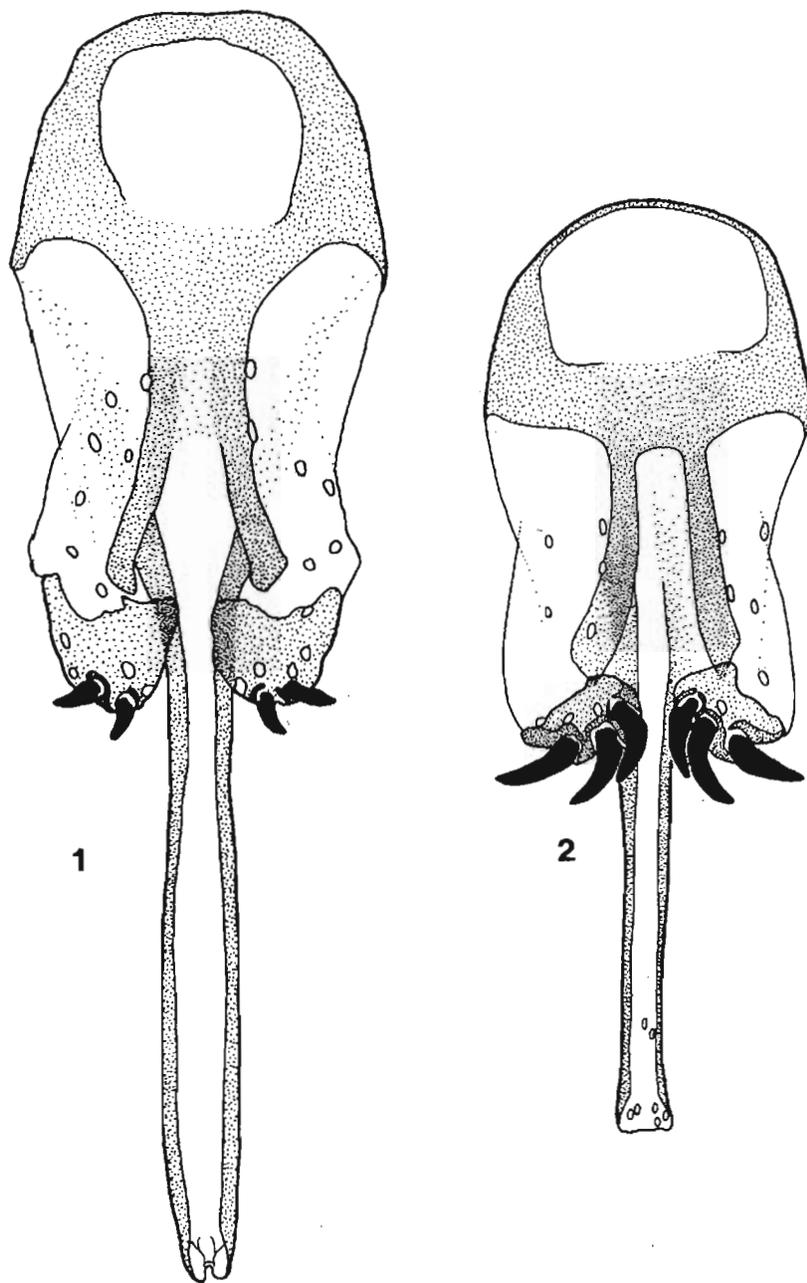


Fig. V

Male genitalia (ventral view, 921 x) of 1. *Telenomus lobatus* sp. n. and
2. *T. tridentatus* sp. n.

Dodd in his numerous works on Australian Proctotrupeidea. Through the host relationships and our discussion of the male genitalia we believe we have made this name identifiable, and therefore we are justified in describing this species at this time and in this context.

Telenomus lobatus new species

(Figs. II, 3; III, 3; V, 1; Plate II, 5-6)

Agrees with the description of *Telenomus chrysopae*, except for the following: eyes larger, eye height slightly greater than frons width; mandibles tridentate, middle tooth smaller than outer ones; wrinkles in malar region below level of antennal insertions, curving dorsad (pl. II, 6); genitalia (fig. V, 1): digiti each with two long, widely separated teeth; laminae volsellares in form of pair of strong, apically diverging rods or struts; aedeagal lobe extremely long and narrow, length of aedeago-volsellar shaft 1.8 times length of aedeagal lobe, apex distinctly notched; penis valves present along entire length of aedeagal lobe; antennae (figs. II, 3; III, 3). The host eggs of this species were not available.

Material. Holotype ♂: Washington, D.C. (U.S.A.); 1960; Ex *Lomamyia flavicornis*; genitalia slide 191 (USNM). Paratypes: 2 ♀ ♀ with same data as holotype.

Host: *Lomamyia flavicornis* Walker (*Neuroptera: Berothidae*).

Remarks. *Telenomus lobatus* may be distinguished from the closely related *T. tridentatus* by the presence of only two teeth on each digitus and the relatively longer aedeagal lobe (length of aedeago-volsellar shaft/length of aedeagal lobe = 1.80 in *lobatus*, 2.09-2.13 in *tridentatus*). The shape of the male genitalia place both of these species in the *dalmanni* species group of the *californicus* complex (Johnson, 1982 in press, and see below). *Telenomus tridentatus* and *T. lobatus* may be distinguished from the other members of that species group by means of the 11-segmented female antennae (10-segmented in all other species so far known).

Telenomus suvae new species

(Figs. II, 4; III, 4; IV, 1; Plate III, 1, 2, 5)

Agrees with description of *Telenomus chrysopae*, except as follows: mandibles tridentate; wrinkles in malar region oblique, only weakly arcuate (pl. III, 5); male genitalia (fig. IV, 1): each digitus armed with 3 small

teeth; laminae volsellares weakly differentiated into pair of parallel rods; aedeagal lobe relatively longer and narrower; length of aedeago-volsellar shaft 2.71 times length of aedeagal lobe, 3.07 times length of basal ring; antennae (figs. II, 4; III, 4).

Host eggs not available for study.

Material. Holotype ♂: Fiji Islands, Suva, 30.III.1942, R.A. Lever, Ex eggs of *Chrysopa* sp., H. 481; genitalia slide 293 (BMNH).

Paratypes: 4 ♀ ♀ with same data as holotype. 1 ♀, Suva, Fiji, 5.IV.1945, R.A. Lever, Ex. *Chrysopa* eggs, H. 662 (BMNH).

Host: *Chrysopa* sp. (Neuroptera: Chrysopidae).

Remarks. *Telenomus suvae* can probably only be confidently identified when reared males are available. This species may be distinguished from *T. chrysopae* by the relatively longer aedeagal lobe and the paired (instead of single) rods of the laminae volsellares.

***Telenomus tridentatus* new species**

(Figs. I, 7-8; II, 2; III, 2; V, 2; Plate II, 3, 4).

Agrees with the description of *Telenomus chrysopae* except as follows: mandibles distinctly tridentate; wrinkles in malar region present only below level of antennal insertions, short, transverse, not arcuate (pl. II, 4); male genitalia (fig. V, 2): each digitus with 3 massive, curved teeth; laminae volsellares in form of pair of strongly melanized, apically diverging rods or struts; aedeagal lobe narrow, elongate, length of aedeago-volsellar shaft 2.09-2.13 times length of aedeagal lobe; penis valves present along entire length of aedeagal lobe; antennae (figs. II, 2; III, 2).

Host egg (figs. I, 7-8): chorion pale gray; meconium, seen through chorion, appearing as dark gray blotch, viewed directly, brownish-red; edges of emergence hole very ragged; irregular.

Material. Holotype ♂: Tucson, ARIZ, Aug. 1, em. Aug. 8, ex chrysopid egg, Johnson 1962 161; *Telenomus* sp. A, det. 1973, F. Werner (USNM). Paratypes: 5 ♀ ♀, 5 ♂ ♂ with locality data as holotype, collected July 31, em. Aug. 8-9 (Johnson 1962 164, 167, 169, 163); collected Aug. 1, em. Aug. 6-9 (Johnson 1962 165, 145, 153, 146, 155, 150, 171) (USNM, University of Arizona). Minnesota: Ramsey Co., University Farm, 4, 9.VIII.1956, ex chrysopid egg on corn, Collector M.E. Warters, 1 ♂, 1 ♀ (USNM). Arkansas: Washington Co., 19.VII.1966, Ex-egg *Chrysopa*, coll. W. Tadic, 3 ♂ ♂ (University of Arkansas). South Carolina: Batesburg, 15, 17.VII.1914, Issued 20, 23.VII.1914, Ex eggs of chrysopid, on cotton, McGregor

& McDonough, 2 ♀ ♀ (USNM); ex eggs *Chrysopa* sp., E.A. McGregor Collector, Collection of R.M. Fouts, accessioned by L.A.C.M. 1973, *Telenomus chrysopae* Ash. Fov. 1 ♀ (Los Angeles County Museum).

Host: *Chrysopidae*. References to *Chrysopa* should be accepted with caution.

Remarks. *Telenomus tridentatus* is most similar to *T. lobatus* and may be distinguished from it on the basis of the characters of the male genitalia described under Remarks for that species.

NOMINA DUBIA

Telenomus acrobates

Telenomus acrobates Giard, 1859: 77-78, ♂, ♀. Type locality: Vaucroze, Provence, France. Host: *Chrysopa* sp.

Telenomus acrobates: Kieffer, 1912: 24-25.

Phanurus acrobates: Kieffer, 1926: 52.

Telenomus acrobates: Kozlov, 1967: 370.

Telenomus acrobates: Kozlov, 1978: 643, 646.

Telenomus ferganae

Telenomus chrysopae Vassiliev, 1915: 17, ♂, ♀, not *chrysopae* Ashmead, 1893. Type locality: Skobelev, Fergana, Uzbek S.S.R., USSR. Host: *Chrysopa* sp.

Telenomus ferganae Johnson, 1982, in press; replacement name for *chrysopae* Vassiliev.

Key to species of *Telenomus* reared from eggs of *Neuroptera* (based on male genitalia):

- 1 (1) Aedeagal lobe extremely long and narrow, length of aedeago-volsellar shaft < 2,5 x length of aedeagal lobe (figs. V, 1, 2). 2
- Aedeagal lobe short, broad, length of aedeago-volsellar shaft > 2,5 x length of aedeagal lobe (figs. IV, 1-3) 3
- 2 (1) Each digitus with 3 teeth (fig. V, 2). *tridentatus* (Nearctic)
- Each digitus with 2 widely separated teeth (fig. V, 1). *lobatus* (Nearctic)
- 3 (1) Digital teeth long, massive; laminae volsellares in form of evenly pigmented

- plate; aedeagal lobe distinctly narrower than base of aedeago-volsellar shaft
fig. IV, 3) *ampullaceus* (Australia)
- Digital teeth small; laminae volsellares in form of ventral rod (s); aedeagal lobe
only slightly narrower than aedeago-volsellar shaft (fig. IV, 1, 2). 4
- 4 (3) Laminae volsellares in form of single median rod (fig. IV, 2).
. *chrysopae* (Holarctic)
- Laminae volsellares in form of paired rods (fig. IV,1) *suvae* (Fiji Is.)

DISCUSSION

The species of *Telenomus* parasitizing neuropteran eggs appear at first glance to be a relatively homogeneous group, at least in terms of host relationships and external morphology. The inability to distinguish among the species dealt with here is, however, misleading. These species belong to the *T. californicus* complex of species (Johnson, 1982 in press) and, in fact, cannot be reliably separated from the hundreds of other species in this group solely on the basis of characters drawn from external morphology. The study of the male genitalia shows that these neuropteran parasitoids form a very heterogeneous assemblage.

On the basis of the structure of the genitalia, both *Telenomus lobatus* and *T. tridentatus* appear to be more closely to the members of the *T. dalmanni* species group (including the lepidopteran parasitoids *dalmanni* (Ratzeburg), *hemerocampae* Wilcox, *pallidipes* (Thomson), *narolus* Nixon, *monodactylus* Liu, *closterae* Wu and Chen, and *parnaruae* Wu and Chen than to at least *T. chrysopae* and *T. suvae*. This implies that the group of neuropteran parasitoids is not monophyletic, i.e., the use of the eggs of lacewings and their allies as hosts by species of *Telenomus* has evolved at least twice.

SUMMARY

The species of *Telenomus* (Hymenoptera: Scelionidae) that parasitize the stalked eggs of Neuroptera are revised. The Holarctic species *T. chrysopae* Ashmead is redescribed. Four new species are described: *T. ampullaceus* (Australia), *T. suvae* (Fiji), *T. tridentatus* (Nearctic) and *T. lobatus* (Nearctic). The type specimens of *T. acrobates* Giard and *T. jerganae* Johnson (= *T. chrysopae* Vassiliev) are apparently lost; these names are therefore treated as *nomina dubia*.

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EXPLANATION OF PLATES

PLATE I

Telenomus chrysopae Ashm. ♀

1. — Head in frontal view (192 x)
2. — Detail of lower face showing facial wrinkles (352 x)
3. — Head in dorsal view (192 x)
4. — Head in lateral view (192 x)
5. — Mesosoma in lateral view (160 x)
6. — Mesosoma in dorsal view (176 x)

PLATE II

1. — *Telenomus chrysopae* Ashm. ♀. Detail of mesosoma and metasoma (256 x)
2. — *Telenomus chrysopae* Ashm. ♀. Metasoma in dorsal view (192 x)
3. — *Telenomus tridentatus* sp. n. ♀. Head in frontal view (192 x)
4. — *Telenomus tridentatus* sp. n. ♀. Detail of lower face showing facial wrinkles (352 x)
5. — *Telenomus lobatus* sp. n. ♀. Head in frontal view (192 x)
6. — *Telenomus lobatus* sp. n. ♀. Detail of lower face showing facial wrinkles (384 x)

PLATE III

1. — *Telenomus suvae* sp. n. ♀. Head in frontal view (192 x)
2. — *Telenomus suvae* sp. n. ♀. Detail of lower face showing facial wrinkles (384 x)
3. — *Telenomus ampucellaceus* sp. n. ♂. Head in frontal view (192 x)
4. — *Telenomus ampucellaceus* sp. n. ♂. Detail of lower face showing facial wrinkles (384 x)
5. — *Telenomus suvae* sp. n. ♀. Detail of lower face showing facial wrinkles (768 x)
6. — *Telenomus ampucellaceus* sp. n. ♂. Detail of lower face showing facial wrinkles (768 x)

PLATE IV

Telenomus chrysopae Ashm., ♂, emerging from *Chrysopa* egg.

